REMARKS

Claims 1-18 are pending in the present application. Claims 12-18 have been added to more particularly define what Applicants regard as their invention. Claims 1, 7, 10, 11, and 12 are independent.

Drawing Objections

The drawings are objected to because there are several blank boxes in Fig. 1 that should be labeled. This drawing objection is respectfully traversed.

Concurrently filed herewith are replacement drawing sheets that include drawing corrections addressing the objections raised in the Office Action.

Art Rejections

Claims 1-5, 7, 8, 10 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ford (USP 6,392,769) in view of Okano (USP 6,449,074). Claims 6 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ford, Okano and further in view of Miyachi (USP 5,920,414). These rejections, insofar as they pertain to the presently pending claims, are respectfully traversed.

Initially, it is respectfully submitted that both of the primary patents relied upon in the Office Action (Ford and Okano)

are directed to an entirely different problem than the problem solved by the present invention. More specifically, both Ford and Okano are directed to automatic level control circuits that adjust the power lever of the WDM wavelength being transmitted through an OADM (optical add/drop multiplexer). By adjusting the relative signal strength of the WDM wavelengths in a controlled manner, both Ford and Okano provide automatic level control. This is a very distinct problem than the problem solved by the present invention.

More specifically, the present invention is directed to controlling or reducing the effects of optical power transients in an optical communications network. Such transients occur when WDM channels are added, dropped, dynamically switched, fail, etc. As the optical WDM wavelengths may change in a dynamic fashion in modern optical networks, optical transients may occur. Such transients may be exacerbated by such components as optical amplifiers which allocate unused power to the remaining signals potentially causing a substantial increase in their power. Conversely, newly added optical wavelengths can cause substantial power drop in the existing wavelengths. As discussed on page 2 of the present application, such optical power transients can be quite detrimental for a variety of reasons including equipment damage, data loss, increased distortion and noise, etc.

Turning to the Office Action in more detail it is asserted that neither Ford nor Okano even, when taken in combination, do not

disclose or suggest the invention as now recited in the amended independent claims. Attention is respectfully directed to Fig. 4 of Ford to help prove this point. As shown in Fig. 4 of Ford, a feedback loop including a detector 405, controller 409 and power adjuster 402 is utilized to automatically control the level of the various WDM wavelengths. The detection of the individual wavelengths is detected at a point downstream from the power adjustment point as clearly shown in Fig. 4. Furthermore, the power adjustment by power adjuster 402 occurs in response to a feedback signal from the detector 405. This is in sharp contrast to the presently claimed invention as further explained below.

Even more specifically, neither Ford nor Okano even when taken in combination discloses or suggests a plurality of idler lasers that provide a compensating wavelength for injection into an associated one of the optical signal paths downstream from where an associated one of the optical power monitors sense and in response to an associated total signal power as further recited in independent claim 1. Even if the power adjustor 402 could somehow be construed as an idler laser (which it clearly is not) the feedback circuitry shown in Fig. 4 of Ford clearly locates the power adjuster 402 at a point upstream from the detector 405. This is in sharp contrast to amended independent claim 1 wherein the adjustment mechanism is downstream from where the power detection occurs. Although this upstream/downstream distinction may seem

minor it has major and very significant effects on the operation and results achieved.

Specifically, the invention essentially operates according to a feedforward principle which can substantially squelch or eliminate transients before they reach downstream elements. As shown in Fig. 1, the idler laser 32 injects a compensating wavelength at a point downstream from the optical power monitor. Thus, the compensating wavelength and its associated power may completely compensate for any transients that may occur before that transient makes it to further downstream elements such as multiplexer 16 and output signal pathway 24. Such a response to transients cannot be accomplished by Ford and Okano even when taken in combination.

Clearly, Ford's feedback mechanism adjusts the power at a point upstream of the detector. Thus, by the time a power level fluctuation is detected by Ford's detector 405 any transient in the system will already have propagated to downstream elements such as multiplexer 404 and other downstream elements. Thus, Ford's invention is completely inappropriate and certainly does not disclose or suggest the optical power transient solution disclosed and claimed by the present invention.

In other words, Ford's power adjustments come too late and in a feedback loop that certainly does not compensate for any optical power transients in a suitable manner. Indeed, Ford's invention is

directed to automatic level control which is a substantial different environment and does not disclose or suggest optical power transient solutions, particularly those recited in the independent claims.

Applicants realize that this is a combination rejection of Ford and Okano. It is respectfully submitted that Okano's invention does not remedy any of the noted deficiencies in Ford even when taken in combination therewith. A closer examination of Okano will prove this point.

As discussed in Okano, Okano's disclosed invention is clearly directly to automatic level control (ALC) as discussed throughout his patent. In order to perform automatic level control, Okano monitors the number of channels utilizing a channel number monitor (see column 7, lines 44-49 as well as specific embodiments of the channel number monitor described in Figs. 10 and 11). Significantly, the channel number monitor of Fig. 10 utilizes a spectrum analyzer in order to find signal breaks in one or more of the WDM channels. The other alternative for the channel number monitor is shown in Fig. 11 and merely detects the presence or absence of specific WDM channels.

It is emphasized that Okano performs no power measurement. Instead, Okano merely detects whether a channel is present or not in order to arrive at a total number of channels. In response to the number of channels, a light source 52 may be turned on in order

to provide automatic level control. Thus, Okano does not disclose or suggest a plurality of idler lasers that injects a compensating wavelength into an associated one of the optical signal paths in response to an associated total signal power sent by an associated one of the optical power monitors as recited in claim 1.

No such optical power monitoring is disclosed or suggested by Okano. Okano merely counts channels. Furthermore, it appears from Okano's disclosure that a feedback mechanism is utilized such that shown in Fig. 10 in which the channel count monitor 42 feeds back a control signal to the light source 52 as further shown in Fig. 7. Such a feedback control mechanism in which the light source is upstream of the detector element is completely opposite to the feedforward control mechanism of the present invention which can eliminate or at least substantially reduce optical power transients.

Likewise, the combination of Ford and Okano does not disclose or suggest the optical device recited in independent claim 7. The claim amendments made to claim 7 are the same amendments made to claim 1. Thus, the arguments above relating to claim 1 apply with equal force to claim 7.

Still further, the combination of Ford and Okano does not disclose or suggest the invention recited in method claims 10 or 11. Specifically, both of these claims recite injecting a separate compensating wavelength into each of the optical signal path at a

location downstream from where the associated power lever is detected and in response to an associated power level. The downstream injection of the compensating wavelength is a feature not found in any of the applied arts even when taken in combination.

Such a downstream injection of the compensating wavelength is entirely appropriate to control optical power transients -- a fact which is not true of the proposed combination advanced by the Office Action. To the extent any power level is detected such as in Ford, this power level is not utilized in an injecting step that injects a separate compensating wavelength in response to an associated power level. Clearly, Ford's automatic level control adjusts the power level of the WDM wavelength itself. Even when taken in combination with Okano, no such injection of a compensating wavelength in response to an associated power level is disclosed or suggested. Okano's automatic level control circuit clearly operates in response to the total number of channels present which is a entirely different control concept than that disclosed by Ford and is, therefore, not combinable therewith.

Indeed, motivation is lacking for combining Okano and Ford. Although Okano does suggest a plurality of light sources for automatic level control in a WDM system, each of these light sources 52 operates in response to the total number of channels (as determined by the channel number monitor). In no sense do these

light sources 52 operate in response to any detected power level, particularly a power level of a path associated with the light source 52.

Furthermore, Ford's power adjuster which is disclosed as either an amplifier, VOA or combination thereof (see column 5, lines 47-55) if fully sufficient to provide automatic level control and it is not seen how the addition of Okano's additional light sources 52 would add to Ford's solution. This is particularly true because Okano's additional light sources operate on an entirely different control principle (total number of channels present) than Ford's feedback power level control scheme. Thus, there is no motivation to combine these patents as the Office Action suggests.

Lastly, the addition of Miyachi do not remedy any of the noted deficiencies in the base combination of Ford and Okano. Indeed, Miyachi is merely applied to teach the features of dependent claim 6 and 9. Because these features are not relied upon to distinguish the invention at this time, no further arguments are necessary. A detailed review reveals that Miyachi does not teach or suggest any of the noted deficiencies in the base combination of Okano and Ford.

For all the above reasons, taken alone or in combination, Applicants respectfully request reconsideration and withdraw of the art rejections.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael R. Cammarata (Reg. No. 39,491) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By ______________________
Michael R. Cammarata, #39,491

MRC/kpc

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

(Rev. 02/12/2004)

REPLACEMENT SHEET

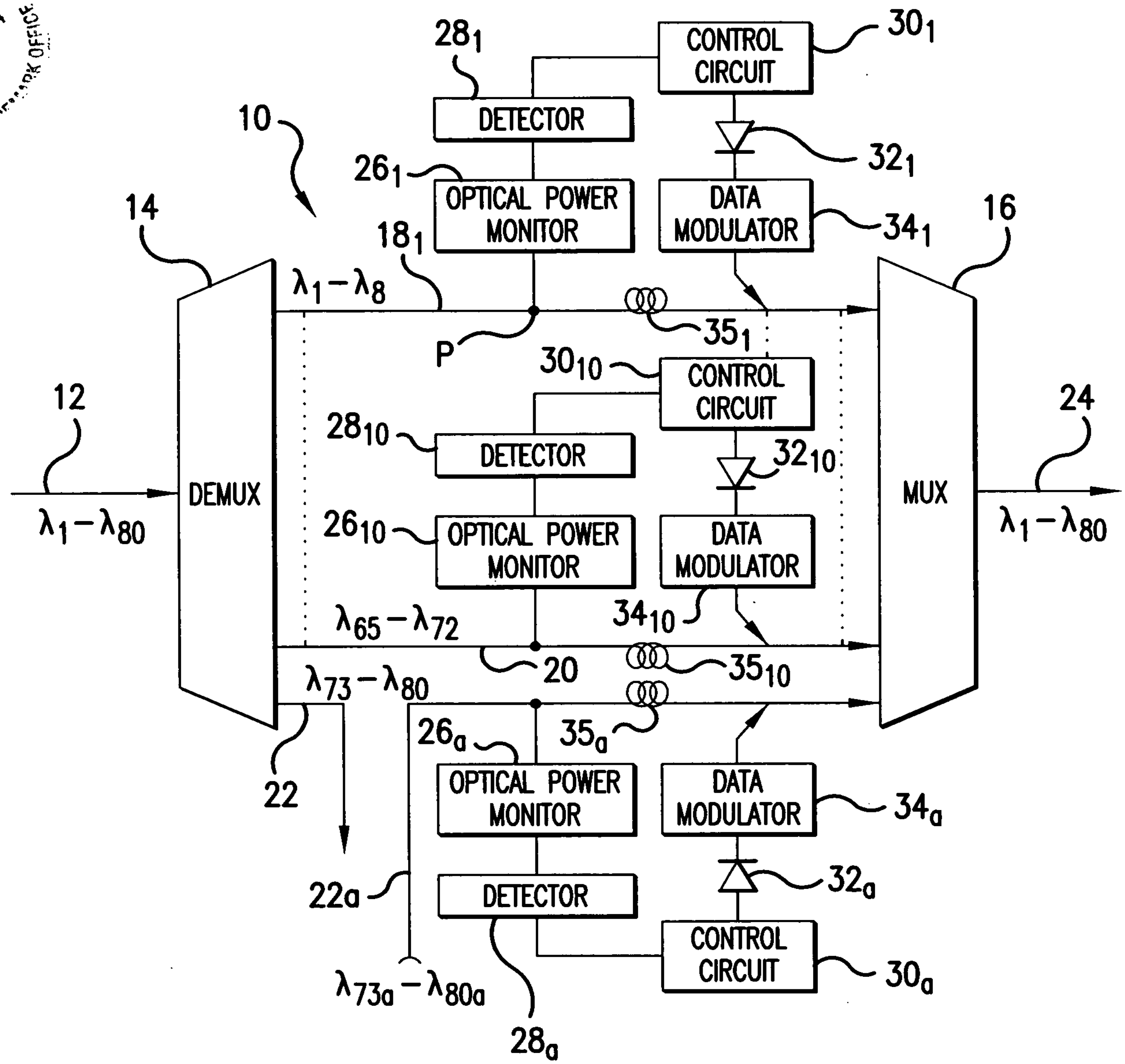

FIG.1

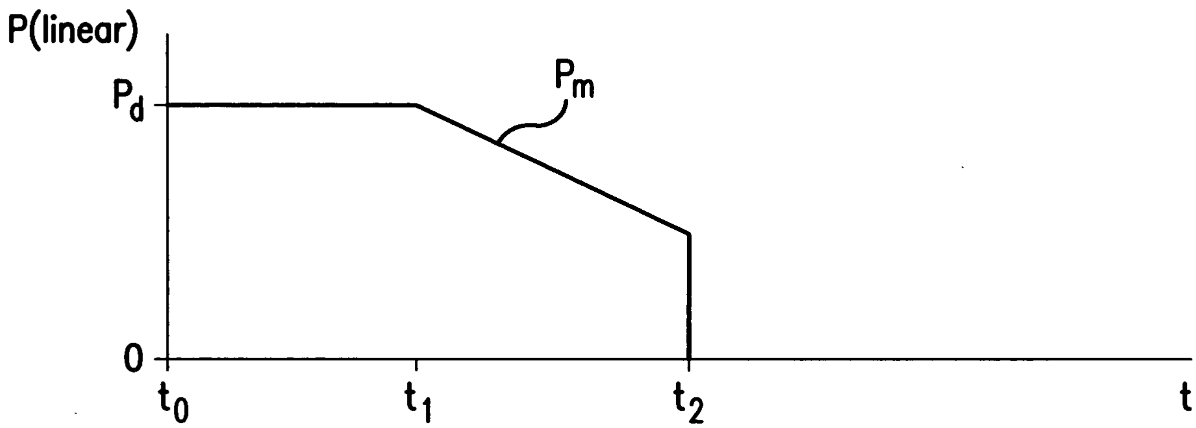

FIG.2A

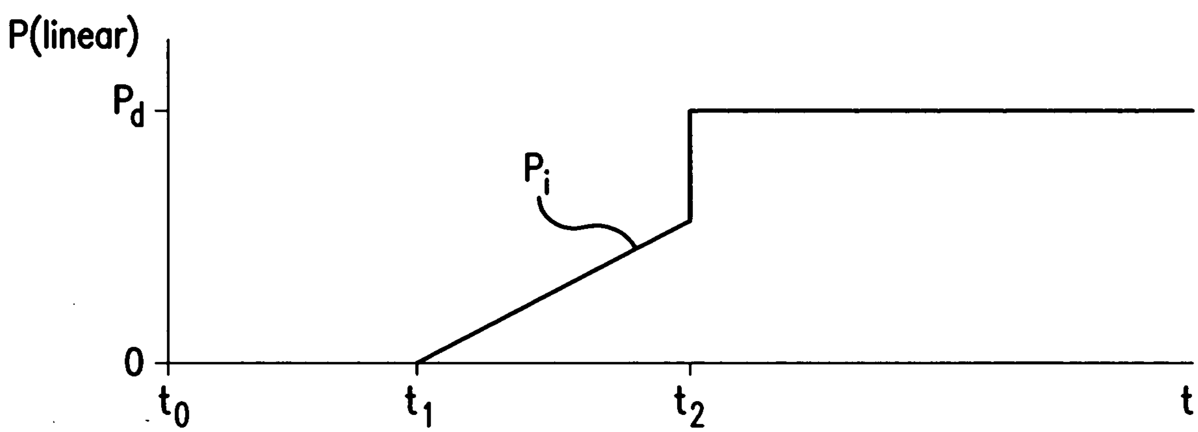

FIG.2B